REMARKS

In the Office Action of March 29, 2005, Claims 1-42 were presented for examination. Of these, Claims 1-9, 11-13, 15-19, 21-25 and 29-42 were rejected. Claims 10, 14, 20 and 26-28 were "objected to" as dependent upon a rejected base claim, but otherwise being allowable if rewritten in independent form.

Applicant will address, in turn, each of the Examiner's rejections. In light of the remarks which follow and the amendments above, reconsideration and allowance are requested.

Rejections Under 35 U.S.C. §102(a)

A.   Claims 1-4, 6-8, 15-18, 21-24, 29, 33-39 and 42 were rejected under 35 U.S.C. §102 (a) as being anticipated by Magoon et al.

Starting with claim 1, the subject matter of the invention relates to a variable frequency oscillator employing a variable frequency oscillator core, such as typically will be used in a mobile telephone. An illustrative embodiment of such an oscillator core is schematically illustrated in Fig. 1. In essence, as shown in that example, the frequency of the oscillator is determined by a resonant LC tank circuit and a bank of capacitors which are selectively switchable into or out of the tank circuit in order to change the resonant frequency. Each capacitor, and its associated switch, are real components. Hence, they inherently include some resistance. The resistive element introduced into the circuit varies as capacitors are switched in and out. Consequently, the amplitude of oscillation of the circuit also changes. See page 12, lines 7-16. Thus, it is advantageous to perform oscillation amplitude control.

Magoon '391 describes a variable frequency oscillator core in which the frequency selection is performed by selectively switching capacitors into or out of a resonant circuit, and in which amplitude control means is also provided. The amplitude control, as best shown in Fig. 10, is performed by selectively switching current sources into the supply to the oscillator core. While Magoon et al. is certainly relevant prior art, it does not appear to teach, disclose or suggest the method of control reflected in claim 1 as originally filed, and as now amended.

Magoon et al. '391 discusses the performance of a frequency approximation search in columns 9 and 10. However, it then goes on at column 11, lines 1-18, to suggest that it is important that the amplitude control circuit 802 communicates with the controllable oscillator 202 as the frequency of the output signal of the controllable oscillator is controlled, so as to maintain the amplitude of the output signal. There is also a passage, at column 12, lines 14-20, which states that in some embodiments the amplitude control circuit may operate in conjunction with the frequency control circuit, "for instance every time control changes to frequency of the output signal of the oscillator the amplitude control circuit may be enabled to adjust to the amplitude of the output signal." The Examiner has taken these passages as indicating that the present invention has been anticipated. However, this is an unfair reading of the reference. On a fair reading, these passages merely suggest that once the frequency approximation search has been completed, amplitude stabilization is then performed. There is no explicit teaching of how to do so, and certainly no teaching of interleaving the amplitude stabilization with the various stages of the successive frequency approximation search. Manifestly, therefore, the Examiner has fallen into the trap of construing the prior art in the light of knowledge of the present invention. He reads into the reference a disclosure it does not contain.

Claim 1 is amended to include the limitations of claim 3 and to clarify that following selection of a frequency band, the output voltage stabilization device is operated to control the output voltage to obtain a target output voltage value, prior to testing the operating frequency of the oscillator. That is, the invention of claim 1 performs a successive approximation frequency search wherein each step of the successive approximation frequency search is interleaved with an amplitude control step such that, after changing the selection of capacitors connected to the resonant tank circuit of the oscillator, the amplitude of the oscillator is then controlled to obtain its target value, prior to testing the oscillator frequency to determine whether the new selection of capacitors should be kept. Again, there is no clear teaching in Magoon et al. disclosing or suggesting this method of control. Consequently, claim 1, both as amended and as originally filed, is not anticipated. Claims 2, 4, 6-8 and 15-16 all depend from claim 1 and are similarly allowable.

Claim 17 is an independent method claim effectively reciting the method that is implemented in the apparatus of claim 1. Hence, the foregoing explanation that interleaving of the frequency adjustment and amplitude correction processes are not disclosed in Magoon et al, also applies to claims 17-18 and 21-22.

Claim 23 has been amended to include the limitations of claim 26, which had merely been "objected to." Hence, the anticipation rejection of claims 23 and 26 is now moot. Claim 24 is deleted.

Claim 29 depends from claim 23 and is allowable for like reasons as claim 23.

Claim 33 is cancelled, making its rejection moot.

As to claims 34-36, Applicant has studied the Office Action and cannot identify how the Examiner is applying Magoon et al. to find anticipation of the subject matter of these claims. The Examiner does not identify, for example, a constant of proportionality modifier (or "correction calculator" - see below). Accordingly, a *prima facie* basis for the rejection has not been provided and the rejection should be withdrawn. Alternatively, a new, non-final action should be issued, wherein the Examiner expounds on the basis for this rejection with sufficient information to allow Applicant to understand why the Examiner believes the reference supports the rejection.

Claims 37 and 38 relate to the subject matter disclosed with respect to Fig. 12 of the application. As stated in claim 37, part of the method involves "deriving a correction value based on the target frequency for modifying the constant of proportionality relating to the change in oscillator frequency with respect to a frequency control voltage." As previously stated, the Examiner has not identified any passage in Magoon et al. which discloses modifying a constant of proportionality.

Further, referring to claims 37 and 38, once the core's frequency control has been performed by switching capacitors into and out of the resonant circuit, fine frequency control of the oscillator is performed using a varactor, in the Fig. 12 embodiment. The passage from page 6, line 7 to the end of the application explains that the capacitance of the varactor varies over a cycle, but that the average capacitance is a function of the control voltage. This function contributes to the voltage-to-frequency gain of the oscillator, K_{VCO}, which itself is a strong

function of the oscillator amplitude and is therefore affected by frequency band, temperature and batch variations, as well as operating frequency of the oscillator. The frequency-amplitude calibration removes the dependence of K_{VCO} on the frequency band, temperature, and batch-to-batch variations, but K_{VCO} remains a function of the frequency of the oscillator. The arrangement shown in Fig. 12, and reflected in claims 37 and 38 to a degree, recognizes that K_{VCO} varies as a function of frequency; and, in fact, generally varies with the cube of the frequency. Therefore, as set out in the patent, the correction needs to vary as the square of the frequency. Therefore, these claims relate to the generation of a further correction signal in order to control the varactor. This feature is not disclosed or suggested in Magoon et al. Claims 37 and 38 are thus allowable.

Additionally, claim 38 has been amended to correct an error and to more particularly recite that the further correction signal is a function of the target frequency, rather than frequency error.

Claim 42 is an independent claim which includes all the limitations of claim 1 by cross reference, and is allowable over Magoon et al. for the reasons given above with respect to claim 1.

B.   Consequently, the rejection of claims 1-4, 6-8, 15-18, 21-24, 29, 33-39 and 42 as anticipated by Magoon et al. should now be withdrawn.

Claims 30, 31 and 40-41 have been rejected under 35 U.S.C. §102(a) as anticipated by or, in the alternative, under 35 U.S.C. §103 as obvious over, Magoon et al.

Claim 30 depends from claim 29, which has already been discussed above. Thus, claim 30 certainly is not anticipated by Magoon et al.

Claim 30 adds the further limitation that the digitally-controlled current supply device comprises a plurality of current mirrors arranged in parallel, the mirrors being individually controllable between on and off states. The Examiner has presumed the current sources of Magoon et al. to be current mirror type current sources. It would have been obvious, asserts the Office Action, to use current mirror current sources, owing to motivation to have accurate amounts of current supplied to the oscillator from a stable reference current, which results in a

stable frequency, and which is well known in the art. The Examiner asserts that Magoon et al. said the capacitors were binary weighted and that the current sources may be controlled the same way. Applicant disagrees with the Examiner as to how one skilled in the art would understand the disclosure of Magoon et al. However, be that as it may, it is sufficient to note that claim 30 depends from claim 29 which, for reasons stated above, is allowable. Likewise, claim 31 depends from claim 30 and is allowable for the same reasons.

Claims 40 and 41 have been cancelled, mooting their rejection.

C.   Claims 11-13 have been rejected under 35 U.S.C. §102(a) as anticipated by Rogers.

Claim 11 has been amended to include the limitations of claim 14 (which has been cancelled), mooting this rejection.

Claim Rejections - 35 U.S.C. §103(a)

Claims 5, 9, 19, 25 and 32 have been rejected under 35 U.S.C. §103(a) as obvious over Magoon et al. in view of Rogers.

This rejection rests upon the faulty premise that claims 1 and 4 are anticipated by Magoon et al. As demonstrated above, that conclusion is flawed. To find the subject matter of claim 5 obvious over the prior art, it is necessary for the Office to establish that the totality of limitations of claims 1, 4 and 5 are suggested by the references. However, for reasons already stated with respect to claim 1, this exercise fails. Magoon et al. does not teach required elements of claim 1 and Rogers does not supply those missing elements. Thus, the rejection should be withdrawn as to claims 5 and 9.

Likewise, claim 19 depends from claim 17, the latter having already been discussed above. As interleaving of the frequency adjustment and amplitude correction processes are not disclosed in Magoon et al. and the Examiner has not shown them in Rogers, the rejection of claim 19 should be withdrawn.

Claim 25 has been deleted.

Claim 32 depends from claim 29, which depends from claim 23. Again, claim 23 has been amended to include the limitations of claim 26, resulting in an allowable claim per the Office Action. Hence, the rejection of claim 32 is moot.

Claim Rejections - 35 U.S.C. §112

Claims 35 and 36 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite due to parent claim 34 failing to provide an antecedent basis for the "control signal modifier." In response, claims 34-36 have been amended to change "constant of proportionality modifier" and "control signal modifier" to --correction calculator--. The corresponding element in the drawings is labeled "534" (see Fig. 12). Accordingly, the rejection should now be withdrawn.

Claims Objected To

Applicant notes with appreciation that claims 10, 14, 20 and 26-28 would be allowable if rewritten in independent form. In light of the amendment to claim 1, and the above arguments, Applicant defers rewriting claim 10. Claim 14 has been cancelled and its limitations included in claim 11 so that claim 11 now is, in fact, the claim that would result if claim 14 had been rewritten in independent form to include all the limitations of the base claim and any intervening claims. Accordingly, claim 11 is, per the Office Action, allowable. Claim 20 depends, indirectly from claim 17, which has been amended and is allowable for the reasons discussed above. Accordingly, any further amendment to claim 20 is deferred. Claim 26 has been cancelled and its limitation included in claim 26, so that claim 23 constitutes the independent claim that would have resulted from rewriting claim 26 in independent form. Accordingly, claim 23 and its dependent claims 27-32 are all allowable per the Office Action.

CONCLUSION

For the reasons stated above, all pending claims, therefore, are now allowable.

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,
Stephen Jonathan Brett, Applicant(s)

By: _____
Steven J. Henry, Reg. No. 27,900
Wolf, Greenfield & Sacks, P.C.
600 Atlantic Avenue
Boston, Massachusetts 02210-2206
(617) 646-8000

Docket No.: W0583.70011US00
Date: July 29, 2005
x07/29/05x

921718